

REMARKS

Applicants have amended claims 1, 8, 9, 11-20, 26, 27 and 29-36 to better claim the invention. No new matter has been added.

Claims 1-39 are currently pending in the Application, of which claims 6, 7, 12, 13, 18, 19, 24, 25, 30, 31 and 36 were withdrawn in response to the Restriction Requirements dated January 17, 2007.

I. Claim Rejections under 35 U.S.C. §102(a)

In the Office Action, the Examiner rejected claims 1-5, 8-11, 14-17, 20-23, 26-29, 32-35 and 37-39 under 35 U.S.C. §102(a) as being anticipated by Sauro et al., Omics: A Journal of integrative Biology, Vol. 7, No. 4, 2003 (hereinafter “Sauro”). The Examiner also cited Hucka et al., Pacific Symposium on Biocomputing Vol. 7, p. 450-461, 2002 (hereinafter “Hucka”) as evidence that user annotations are inherent to the system of Sauro. (See the Office Action, page 4). Applicants respectfully traverse this rejection.

A. Claims 1 and 20

Applicants’ claim 1 recites:

1. A system for improved modeling of a biological system that comprises a plurality of chemical reactions, the system comprising:
 - a modeling component comprising a graphical user interface for accepting user commands and input to construct a model of the biological system, the *model being represented in a tabular view and a graphical view, the tabular view being adapted to receive the user commands and input to construct the model;*
 - a simulation engine accepting as input the constructed model of the biological system and generating as output dynamic behavior of the biological system; and
 - an analysis environment in communication with the simulation engine, the analysis environment displaying dynamic behavior of the biological system.

Applicants’ claim 20 recites:

20. A system for improved modeling of a chemical reaction comprising:

a modeling environment accepting user commands and input for constructing a model of a chemical reaction, the *model being represented in a tabular view and a graphical view, the tabular view being adapted to receive the user commands and input to construct the model*;

a simulation engine accepting as input the constructed model of the chemical reaction and generating as output an expected result; and

an analysis environment in communication with the simulation engine, the analysis environment displaying the expected result.

Applicants respectfully urge that Sauro does not disclose or suggest a *model being represented in a tabular view and a graphical view, the tabular view being adapted to receive the user commands and input to construct the model*, which is present in Applicants' claims 1 and 20, because Sauro does not disclose the tabular view of a model recited in Applicants' claims 1 and 20.

In the Office Action, the Examiner claims that "Figure 12 shows that in addition to depicting the model graphically, the model is also displayed as a table" in Sauro. (See the Office Action, page 4). Applicants urge that Figure 12 of Sauro does not disclose the tabular view of a model where *the tabular view is adapted to receive the user commands and input to construct the model*.

Sauro describes Figure 12 as follows.

"Figure 12 illustrates the interaction of METATOOL with JDesigner. JDesigner acts as the model editor from which users can initiate simulation and METATOOL analysis. The figure illustrates two aspects. The lower panel shows the SBWMetatool interface; this displays all the elementary modes that METATOOL found for the displayed model (Calvin Cycle). Note that one of the elementary modes in the lower panel is highlighted. The main canvas shows the Calvin reaction network, and the selected elementary mode is displayed on the reaction network by highlighting the appropriate reactions. This allows a user to easily visualize each elementary mode in turn. The example illustrates the ability of SBW to combine two unrelated applications (JDesigner and METATOOL) and deliver completely new functionality. The other point to make is that METATOOL was

not modified in this project; we only wrote a small separate SBW-based module that could control the running of METATOOL.”

(See Sauro, page 366). In other words, Figure 12 of Sauro merely displays elementary modes for a model displayed on a main canvas. One of the elementary modes is highlighted for the reactions highlighted on the model displayed on the main canvas. Sauro provides no disclosure that Figure 12 includes a tabular view and a graphical view that represents a model where the tabular view is adapted to receive user commands and input to construct the model.

For at least the reasons set forth above, Applicants urge that Sauro does not disclose or suggest Applicants’ claimed *model being represented in a tabular view and a graphical view, the tabular view being adapted to receive the user commands and input to construct the model*. Therefore, Applicants respectfully request that the above 35 U.S.C. §102(a) rejection of claims 1 and 20 be withdrawn.

B. Claims 2-5, 21-23 and 37

Claims 2-5 and 37 depend from independent claim 1 and, as such, incorporate all of the features of claim 1. Therefore, for at least the reasons set forth above with respect to claim 1, Applicants respectfully request that the above 35 U.S.C. §102(a) rejection of claims 2-5 and 37 be withdrawn.

Claims 21-23 depend from independent claim 20 and, as such, incorporate all of the features of claim 20. Therefore, for at least the reasons set forth above with respect to claim 20, Applicants respectfully request that the above 35 U.S.C. §102(a) rejection of claims 21-23 be withdrawn.

Furthermore, Applicants urge that Sauro does not disclose that *the tabular view and the graphical view of the model comprise annotations to the model that are provided by a user*, which is present in Applicants’ claim 37.

The Examiner claims that “[u]ser annotations to the graphical and tabular view is inherent to the system of Sauro et al.,” and “[e]vidence is seen in Hucka et al. which shows user

annotations of S1 and S2 in the model SBW-compliant Jarnac and JDesigner (figure 1 and p.452).” (See the Office Action, page 4). Applicants respectfully disagree.

Hucka describes Figure 1 as follows.

“Figure 1 shows an example of using a collection of SBW-enabled software modules. The upper left-hand area in the figure (partly covered by other windows) shows an SBW-enabled version of JDesigner¹¹, a visual biochemical network layout tool. This module’s appearance is nearly identical to that of its original non-SBW-enabled counterpart, except for the presence of a new item in the menu bar called **SBW**. This is typical of SBW-enabled programs: the SBW approach strives to be minimally intrusive. In this example, the user has created a network model in JDesigner, then has decided to run a time-series simulation of the model. To do this, the user has pulled down the **SBW** menu and selected one of the options listed, *Jarnac Analysis*, to invoke the SBW-enabled simulation program *Jarnac*⁶. This has brought forth a control GUI, shown underneath the plot window in the lower righthand area of Figure 1; the user has then input the necessary parameters into the control GUI to set up the time-series simulation, and has finally clicked the **Run** button in the GUI to start the simulation.”

(See Hucka, page 452). In the above description, Hucka does not disclose or suggest any annotations provided by a user and added to a model. There is no disclosure in Hucka that ***the tabular view and the graphical view of the model comprise annotations to the model that are provided by a user***, which is present in claim 37.

For at least the reasons set forth above, Applicants respectfully urge that Sauro and Hucka do not disclose or suggest each and every feature of Applicants’ claim 37. Therefore, Applicants respectfully request that the above 35 U.S.C. §102(a) rejection of claim 37 be withdrawn.

C. Claims 8 and 26

Applicants’ claim 8 recites:

8. A computer-implemented improved method for modeling a biological process comprising a plurality of chemical reactions, the method comprising:

providing a graphical user interface for accepting user commands and data;
receiving, via the provided user interface, user commands and data;
constructing, using the received user commands and data, a model of the biological process, the *model being represented in a tabular view and a graphical, the tabular view being adapted to receive the user commands and input to construct the model*;
generating, using the constructed model of the biological process, dynamic behavior of the modeled biological process; and
displaying the dynamic behavior of the biological process on a display device.

Applicants' claim 26 recites:

26. A computer-implemented method for integrated modeling, simulation and analysis of chemical reactions, the method comprising:
providing a graphical user interface for accepting user commands and data;
receiving, via the provided user interface, user commands and data;
constructing, using the received user commands and data, a model of a chemical reaction, the *model being represented in a tabular view and a graphical view, the tabular view being adapted to receive the user commands and input to construct the model*;
generating, using the constructed model of the chemical reaction, an expected result of the modeled chemical reaction; and
displaying the expected result.

Applicants respectfully urge that Sauro does not disclose or suggest a *model being represented in a tabular view and a graphical, the tabular view being adapted to receive the user commands and input to construct the model*, which is present in claims 8 and 26. As discussed above with respect to claims 1 and 20, Sauro does not disclose or suggest a *model being represented in a tabular view and a graphical view, the tabular view being adapted to receive the user commands and input to construct the model*.

For reasons set forth above, Applicants respectfully urge that Sauro does not disclose or suggest each and every feature of Applicants' claims 8 and 26. Therefore, Applicants respectfully request that the above 35 U.S.C. §102(a) rejection of claims 8 and 26 be withdrawn.

D. Claims 9-11, 27-29 and 38

Claims 9-11 and 38 depend from independent claim 8 and, as such, incorporate all of the features of claim 8. Therefore, for at least the reasons set forth above with respect to claim 8, Applicants respectfully request that the above 35 U.S.C. §102(a) rejection of claims 9-11 and 38 be withdrawn.

Claims 27-29 depend from independent claim 26 and, as such, incorporate all of the features of claim 26. Therefore, for at least the reasons set forth above with respect to claim 26, Applicants respectfully request that the above 35 U.S.C. §102(a) rejection of claims 27-29 be withdrawn.

Furthermore, Applicants respectfully urge that Sauro and Hucka do not disclose that *the tabular view and the graphical view of the model comprise annotations to the model that are provided by a user*.

As discussed above, Sauro and Hucka do not disclose or suggest that *the tabular view and the graphical view of the model comprise annotations to the model that are provided by a user*. For at least the reasons set forth above, Applicants respectfully urge that Sauro and Hucka do not disclose all of the features of Applicants' claim 38. Therefore, Applicants respectfully request that the above 35 U.S.C. §102(a) rejection of claim 38 be withdrawn.

E. Claims 14 and 32

Applicants' claim 14 recites:

14. An article of manufacture having embodied thereon computer-readable instructions for improved modeling of a biological process comprising a plurality of chemical reactions, the article of manufacture comprising:
 - computer-readable instructions for providing a graphical user interface for accepting user commands and data;
 - computer-readable instructions for receiving, via the provided user interface, user commands and data;
 - computer-readable instructions for constructing, using the received user commands and data, a model of the biological

process, the *model being represented in a tabular view and a graphical view, the tabular view being adapted to receive the user commands and input to construct the model;*

computer-readable instructions for generating, using the constructed model of the biological process, dynamic behavior of the modeled biological process; and

computer-readable instructions for displaying the dynamic behavior of the biological process.

Applicants' claim 32 recites:

32. An article of manufacture having embodied thereon computer-readable instructions for integrated modeling, simulation and analysis of chemical reactions, the article of manufacture comprising:

computer-readable instructions for providing a graphical user interface for accepting user commands and data;

computer-readable instructions for receiving, via the provided user interface, user commands and data;

computer-readable instructions for constructing, using the received user commands and data, a model of a chemical reaction, the *model being represented in a tabular view and a graphical view, the tabular view being adapted to receive the user commands and input to construct the model;*

computer-readable instructions for generating, using the constructed model of the chemical reaction, an expected result of the modeled chemical reaction; and

computer-readable instructions for displaying the expected result.

Applicants respectfully urge that Sauro does not disclose or suggest at least a *model being represented in a tabular view and a graphical view, the tabular view being adapted to receive the user commands and input to construct the model*, which is present in Applicants' claims 14 and 32. As discussed above with respect to claims 8 and 26, Sauro does not disclose a *model being represented in a tabular view and a graphical view, the tabular view being adapted to receive the user commands and input to construct the model.*

For at least the reasons set forth above, Applicants respectfully urge that Sauro does not anticipate Applicants' claims 14 and 32 under 35 U.S.C. §102(a). Therefore, Applicants respectfully request that the above 35 U.S.C. §102(a) rejection of claims 14 and 32 be withdrawn.

F. Claims 15-17, 33-35 and 39

Claims 15-17 and 39 depend from independent claim 14 and, as such, incorporate all of the features of claim 14. For at least the reasons set forth above with respect to claim 14, Applicants respectfully request that the above 35 U.S.C. §102(a) rejection of claims 15-17 and 39 be withdrawn.

Claims 33-35 depend from independent claim 32 and, as such, incorporate all of the features of claim 32. For at least the reasons set forth above with respect to claim 32, Applicants respectfully request that the above 35 U.S.C. §102(a) rejection of claims 33-35 be withdrawn.

Furthermore, Applicants urge that Sauro and Hucka do not disclose or suggest that *the tabular view and the graphical view of the model comprise annotations to the model that are provided by a user*, which is present in Applicants' claim 39.

As discussed above, Sauro and Hucka do not disclose or suggest that *the tabular view and the graphical view of the model comprise annotations to the model that are provided by a user*. For at least the reasons set forth above, Applicants respectfully urge that Sauro and Hucka do not disclose the feature of Applicants' claim 39. Therefore, Applicants respectfully request that the above 35 U.S.C. §102(a) rejection of claim 39 be withdrawn.

II. Claim Rejections under 35 U.S.C. §102(b)

In the Office Action, the Examiner rejected claims 1-5, 8-11, 14-17, 20-23, 26-29, 32-35 and 37-39 under 35 U.S.C. §102(b) as being anticipated by Hucka. (See the Office Action, page 4). Applicants respectfully traverse this rejection.

A. Claims 1 and 20

Applicants respectfully urge that Hucka does not disclose or suggest a *model being represented in a tabular view and a graphical view, the tabular view being adapted to receive the user commands and input to construct the model*, which is present in Applicants' claims 1 and 20.

In the Office Action, the Examiner claims that “Figure 1 shows the model is represented in graphical form and in tabular form.” (See the Office Action, page 5). Applicants urge that Figure 1 of Hucka does not disclose the tabular view of a model recited in claims 1 and 20. In Figure 1, Hucka discloses a GUI for inputting the simulation parameters of a model. Figure 1 of Hucka, however, does not disclose a model represented in a tabular view. Therefore, Hucka does not disclose Applicants’ claimed ***model being represented in a tabular view and a graphical view.***

The Examiner also claims that “[i]n the intermediate window depicted in figure 1, Hucka et al. shows a tabular view with the output variables S1 and S2, which are user annotations to the model in Jarnac.” (See the Office Action, page 5). Applicants respectfully urge that the portion referenced by the Examiner does not disclose that the model is represented in a tabular view. In Figure 1 of Hucka, the output variables S1 and S2 are selected for plotting the selected variables in the plot window. Displaying selected output variables S1 and S2 is not representing a model in a tabular view. There is no disclosure in Hucka of Applicants’ claimed ***model being represented in a tabular view and a graphical view.***

Furthermore, Hucka does not disclose Applicants’ claimed ***the tabular view being adapted to receive the user commands and input to construct the model.*** In Figure 1 of Hucka, the output variables S1 and S2 are selected and displayed. Hucka is silent about Applicants’ claimed ***the tabular view being adapted to receive the user commands and input to construct the model.*** The portion referenced by the Examiner does not disclose ***the tabular view being adapted to receive the user commands and input to construct the model.***

For at least the reasons set forth above, Applicants urge that Hucka does not anticipate Applicants’ claims 1 and 20 under 35 U.S.C. §102(b). Therefore, Applicants respectfully request that the above 35 U.S.C. §102(b) rejection of claims 1 and 20 be withdrawn.

B. Claims 2-5, 21-23 and 37

Claims 2-5 and 37 depend from independent claim 1 and, as such, incorporate all of the features of claim 1. Therefore, for at least the reasons set forth above with respect to claim 1,

Applicants respectfully request that the above 35 U.S.C. §102(b) rejection of claims 2-5 and 37 be withdrawn.

Claims 21-23 depend from independent claim 20 and, as such, incorporate all of the features of claim 20. Therefore, for at least the reasons set forth above with respect to claim 20. Applicants respectfully request that the above 35 U.S.C. §102(b) rejection of claims 21-23 be withdrawn.

Furthermore, Applicants urge that Sauro does not disclose that *the tabular view and the graphical view of the model comprise annotations to the model that are provided by a user*, which is present in Applicants' claim 37.

The Examiner claims that “[i]n the intermediate window depicted in figure 1, Hucka et al. shows a tabular view with the output variables S1 and S2, which are user annotations to the model in Jarnac,” and “[t]he back most window of figure 1 shows the graphical representation of the model annotated with the user annotations of the variables S1 and S2, in JDesigner.” (See the Office Action, page 5). Applicants respectfully disagree.

S1 and S2 depicted in Figure 1 of Hucka are output variables that are plotted on the plot window. The output variables S1 and S2 in Hucka are not annotations to a model that are provided by a user. There is no disclosure in Hucka that *the tabular view and the graphical view of the model comprise annotations to the model that are provided by a user*, which is present in claim 37.

For at least the reasons set forth above, Applicants respectfully urge that Sauro and Hucka do not disclose the feature of Applicants' claim 37. Therefore, Applicants respectfully request that the above 35 U.S.C. §102(b) rejection of claim 37 be withdrawn.

C. Claims 8 and 26

Applicants respectfully urge that Hucka does not disclose a *model being represented in a tabular view and a graphical view, the tabular view being adapted to receive the user commands and input to construct the model*, which is present in claims 8 and 26.

As discussed above with respect to claims 1 and 20, Hucka does not disclose a *model being represented in a tabular view and a graphical view, the tabular view being adapted to receive the user commands and input to construct the model*.

For reasons set forth above, Applicants respectfully urge that Hucka does not anticipate Applicants' claims 8 and 26 under 35 U.S.C. §102(b). Therefore, Applicants respectfully request that the above 35 U.S.C. §102(b) rejection of claims 8 and 26 be withdrawn.

D. Claims 9-11, 27-29 and 38

Claims 9-11 and 38 depend from independent claim 8 and, as such, incorporate all of the features of claim 8. Therefore, for at least the reasons set forth above with respect to claim 8, Applicants respectfully request that the above 35 U.S.C. §102(b) rejection of claims 9-11 and 38 be withdrawn.

Claims 27-29 depend from independent claim 26 and, as such, incorporate all of the features of claim 26. Therefore, for at least the reasons set forth above with respect to claim 26, Applicants respectfully request that the above 35 U.S.C. §102(b) rejection of claims 27-29 be withdrawn.

Furthermore, Applicants urge that Sauro does not disclose that *the tabular view and the graphical view of the model comprise annotations to the model that are provided by a user*, which is present in Applicants' claim 38. As discussed above, there is no disclosure in Hucka that *the tabular view and the graphical view of the model comprise annotations to the model that are provided by a user*, which is present in claim 38.

For at least the reasons set forth above, Applicants respectfully urge that Sauro and Hucka do not disclose the feature of Applicants' claim 38. Therefore, Applicants respectfully request that the above 35 U.S.C. §102(a) rejection of claim 38 be withdrawn.

E. Claims 14 and 32

Applicants respectfully urge that Hucka does not disclose at least a *model being represented in a tabular view and a graphical view, the tabular view being adapted to receive the user commands and input to construct the model*, which is present in Applicants' claims 14 and 32. As discussed above with respect to claims 8 and 26, Hucka does not disclose a *model being represented in a tabular view and a graphical view, the tabular view being adapted to receive the user commands and input to construct the model*.

For at least the reasons set forth above, Applicants respectfully urge that Hucka does not anticipate Applicants' claims 14 and 32 under 35 U.S.C. §102(b). Therefore, Applicants respectfully request that the above 35 U.S.C. §102(b) rejection of claims 14 and 32 be withdrawn.

F. Claims 15-17, 33-35 and 39

Claims 15-17 and 39 depend from independent claim 14 and, as such, incorporate all of the features of claim 14. For at least the reasons set forth above with respect to claim 14, Applicants respectfully request that the above 35 U.S.C. §102(b) rejection of claims 15-17 and 39 be withdrawn.

Claims 33-35 depend from independent claim 32 and, as such, incorporate all of the features of claim 32. For at least the reasons set forth above with respect to claim 32, Applicants respectfully request that the above 35 U.S.C. §102(b) rejection of claims 33-35 be withdrawn.

Furthermore, Applicants urge that Sauro does not disclose that *the tabular view and the graphical view of the model comprise annotations to the model that are provided by a user*, which is present in Applicants' claim 39. As discussed above, there is no disclosure in Hucka

that *the tabular view and the graphical view of the model comprise annotations to the model that are provided by a user*, which is present in claim 39.

For at least the reasons set forth above, Applicants respectfully urge that Sauro and Hucka do not disclose all of the features of Applicants' claim 39. Therefore, Applicants respectfully request that the above 35 U.S.C. §102(a) rejection of claim 39 be withdrawn.

III. Provisional Double Patenting Rejections

In the Office Action, the Examiner provisionally rejected claims 1-5, 8-11, 14-17, 20-23, 26-29 and 32-35 as being unpatentable over claims 1-5, 8-12, 15-18, 26-30, 33-37 and 40-43 of co-pending United States Patent Application Number 10/783,628 (Attorney Docket No. MWS-108) in view of Hucka. (Office Action, page 7). Since the rejection is provisional, Applicants will submit a terminal disclaimer when the pending claims are deemed allowable.

In the Office Action, the Examiner also provisionally rejected claims 1-5, 8-11, 14-17, 20-23, 26-29 and 32-35 as being unpatentable over claims 1-5, 8-20, 20-27, 30-42 and 44 of co-pending United States Patent Application Number 10/783,624 (Attorney Docket No. MWS-110). (Office Action, page 8). Since the rejection is provisional, Applicants will submit a terminal disclaimer when the pending claims are deemed allowable.

IV. Conclusion

In light of the above amendments and arguments, Applicants respectfully urge that all of the pending claims are in condition for allowance. Should the Examiner feel that a teleconference would expedite the prosecution of this application, the Examiner is urged to contact the Applicants' attorney at (617) 227-7400.

Please charge any shortage or credit any overpayment of fees to our Deposit Account No. 12-0080, under Order No. MWS-111RCE. In the event that a petition for an extension of time is required to be submitted herewith, and the requisite petition does not accompany this response, the undersigned hereby petitions under 37 C.F.R. §1.136(a) for an extension of time for as many

months as are required to render this submission timely. Any fee due is authorized to be charged to the aforementioned Deposit Account.

Dated: May 20, 2008

Respectfully submitted,

By Kevin J. Canning
Electronic Signature for: Kevin J. Canning
Registration No.: 35,470
LAHIVE & COCKFIELD, LLP
One Post Office Square
Boston, Massachusetts 02109-2127
(617) 227-7400
(617) 742-4214 (Fax)
Attorney/Agent For Applicant